2. THE PROCESS ACCORDING TO CLAIM ONE WHEREIN THE PRODUCT IS JUICES (SUCH AS,

BUT NOT LIMITED TO APPLE, ORANGE ,LIME, GRAPEFRUIT, GRAPE , CRANBERRY, TANGERINE

, CHERRY, APRICOT, STRAWBERRY, NECTARINE, PEACH NECTAR, APRICOT NECTAR, PINEAPPLE,

RASPBERRY, LEMON, PEAR, ETC; AND ANY MIXTURE THEREOF).

## DESCRIPTION

### 1. FIELD OF INVENTION

A. ULTRA VIOLET ACTIVATED OXYGEN HAS BEEN USED SINCE 1982 FOR BACTERIA REDUCTION IN WELL WATER IN THIRD WORLD COUNTRIES TO PROVIDE CLINICALLY PURE WATER

B. ULTRA VIOLET ACTIVATED OXYGEN HAS BEEN USED SINCE 1982 TO REDUCE BACTERIA FROM "GRAY" WATER TO PRODUCE POTABLE WATER

C. ALSO, IN SOME INSTANCES, A HUMIDIFIER IS USED TO INCREASE THE AMOUNT OF



LAWERNCE GENE COSTELLO
714-633-1598

09803057 .031601

HYDROXYLS AND HYDROPEROXY GENERATED

D. ALSO, IN SOME INSTANCES A SPECIFIC CATALYST IS INTRODUCED INTO THE SYSTEM TO INCREASE THE AMOUNT OF HYDROXYLS AND HYDROPEROXYS.

2. <u>DESCRIPTION OF RELATED ART</u>

A. ULTRA VIOLET ACTIVATED OXYGEN HAS BEEN USED SINCE 1985 TO REDUCE BACTERIA FROM THE EXTERIOR SURFACE AREA OF VEGETABLES (ie. TOMATO, PEPPER, ETC.)

B. ULTRA VIOLET ACTIVATED OXYGEN HAS BEEN USED SINCE 1988 TO REMOVE BACTERIA FROM JUICES (ORANGE, CRANBERRY, APPLE CIDER). THIS WAS DONE ON SMALL SCALE LABORATORY TESTING

C. STARTING IN 1990, TESTING USING ULTRA VIOLET ACTIVATED OXYGEN WAS CONCENTRATED ON APPLE CIDER AND ORANGE JUICE EXCLUSIVELY.IN OUR LAB.

D. ULTRA VIOLET ACTIVATED OXYGEN IS DEFINED AS:

ASSUMING AMBIENT AIR HAS 21% OXYGEN CONTENT, FOLLOWING IS THE TYPES OF GASSES CREATED BY THE ULTRA VIOLET LAMP (185 NANOMETER) FROM THE 21% OXYGEN:

| | |
|---|---|
| HYDROXY RADICAL | 2 % |
| ATOMIC OXYGEN | 0.5% |
| HYDROGEN PEROXIDE | 6% |

LAWRENCE GENE COSTELLO
714-633-1598

| | |
|---|---|
| HYDROPEROXY RADICAL | 2 % |
| HIGHER PEROXIDES | 7% |
| OZONE | 2% |
| UNKNOWN | 1.5% |

CROSS REFERENCE TO RELATED APPLICATIONS---- NOTAPPLICABLE

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH--NOT APPLICABLE

REFERENCE TO MICROFICHE INDEX----NOT APPLICABLE

## SUMMARY

1. BASED ON THE TECHNICAL INFORMATION OBTAINED FROM ACTIVITIES STATED IN "FIELD OF INVENTION" AND "DESCRIPTION OF RELATED ART" AND ON TESTING SINCE 1985 A SPECIFIC PROTOCOL HAS BEEN FORMULATED TO EFFICIENTLY AND AT A LOW COST REDUCE THE BACTERIA FROM JUICE USING ULTRA VIOLET GENERATED ACTIVATED OXYGEN

2. AT PRESENT, PASTEURIZATION (HIGH HEAT) IS THE ONLY F.D.A APPROVED METHOD TO OBTAIN A 5 LOG REDUCTION. UNFORTUNATELY, THE HIGH HEAT DESTROYS ALL THE ENZYMES (AT ANY TEMPERATURE OVER 125 DEGREES F.). ALSO, PASTEURIZATION IS AT LEAST FIVE (5) TIMES MORE EXPENSIVE THAN ULTRA VIOLET ACTIVATED OXYGEN SYSTEMS.

3. THIS ULTRA VIOLET ACTIVATED OXYGEN PROCESS WILL REMEDY THE PROBLEM OF ENZYME LOSS (THERE IS LITTLE OR NO EFFECT ON ENZYMES USING THE ULTRA VIOLET



LAWRENCE GENE COSTELLO
714-633-1598

ACTIVATED OXYGEN SYSTEM)

4. IT HAS BEEN OBSERVED THAT SHELF LIFE IS EXTENDED DUE TO REDUCTION OF BACTERIA.

5. THE LOWER INITIAL COST, AND THE LOW MAINENANCE COST WILL ALLOW EXISTING "MOM AND POP" OPERATIONS TO STAY IN BUSINESS.

09803057.032301



LAWRENCE GENE COSTELLO